

WHAT IS CLAIMED IS:

1. An optic triplexer comprising:

an emitting laser;

a first photodiode; and

5 a second photodiode, wherein said first photodiode and said second photodiode are monolithically integrated on a substrate.

2. The optic triplexer of Claim 1, wherein said

10 emitting laser is monolithically integrated on the substrate.

3. The optic triplexer of Claim 1, wherein said emitting laser is placed on one of said first and second
15 photodiodes.

4. The optic triplexer of Claim 1, further comprising a thin film filter located between said emitting laser and one of said first and second photodiodes.

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5. The optic triplexer of Claim 1, further comprising a thin film filter located between said first photodiode and said second photodiode.

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6. The optic triplexer of Claim 1, wherein said emitting laser, said first photodiode and said second photodiode are packaged within a transistor outline (TO) can.

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7. An optic triplexer comprising:

an emitting laser for transmitting a 1310 +/-10nm optical signal;

10 a first photodiode for receiving a 1490 +/-5nm optical signal; and

a second photodiode for receiving a 1550 +/-5nm optical signal, wherein said first photodiode and said second photodiode are monolithically integrated on a substrate.

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8. The optic triplexer of Claim 7, wherein said emitting laser is monolithically integrated on the substrate.

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9. The optic triplexer of Claim 7, wherein said emitting laser is placed on said first photodiode.

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10. The optic triplexer of Claim 7, wherein said first photodiode has a cutoff wavelength dependent on relative concentrations of dopants in an absorption region of the substrate.

11. The optic triplexer of Claim 7, wherein said second photodiode has a cutoff wavelength dependent on relative concentrations of dopants in an absorption region of the substrate.

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12. The optic triplexer of Claim 7, further comprising a 1310 +/-10nm reflective thin film filter located between said emitting laser and said first photodiode.

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13. The optic triplexer of Claim 7, further comprising a 1490 +/-5nm reflective thin film filter located between said first photodiode and said second photodiode.

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14. The optic triplexer of Claim 7, wherein said emitting laser is a vertical cavity surface emitting laser (VCSEL).

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15. The optic triplexer of Claim 7, wherein said substrate is an InGaAs substrate.

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16. A method for making an optic triplexer, said method comprising the steps of:

providing a substrate;

monolithically forming a photodiode on said substrate;

5 monolithically forming another photodiode on top of said photodiode; and

placing/monolithically forming an emitting laser on top of said another photodiode.

10 17. The method of Claim 16, further comprising a step of forming a thin film filter on top of said photodiode before forming said another photodiode.

15 18. The method of Claim 16, further comprising a step of forming a thin film filter on top of said another photodiode before placing/monolithically forming said emitting laser.

19. The method of Claim 16, wherein:

20 said emitting laser is capable of transmitting a 1310 +/- 10nm optical signal;

said photodiode is capable of receiving a 1550 +/- 5nm optical signal; and

25 said another photodiode is capable of receiving a 1490 +/- 5nm optical signal.

20. The method of Claim 16, wherein said emitting laser is a vertical cavity surface emitting laser (VCSEL).

21. The method of Claim 16, wherein said substrate is
5 an InGaAs substrate.

22. A passive optical network comprising:
an optical line terminal (OLT); and
an optical network terminal (ONT) that incorporates an
10 optic triplexer which includes:

an emitting laser capable of transmitting a 1310
+/-10nm optical signal;

a first photodiode capable of receiving a 1490
+/-5nm optical signal; and

15 a second photodiode capable of receiving a 1550
+/-5nm optical signal, wherein said first
photodiode and said second photodiode are
monolithically integrated on a substrate.

20 23. The passive optical network of Claim 22, wherein
said emitting laser is monolithically integrated onto the
substrate.

25 24. The passive optical network of Claim 22, wherein
said emitting laser is placed on the first photodiode.

25. An optical network terminal (ONT) that incorporates an optic triplexer which includes:

an emitting laser capable of transmitting a 1310 +/-10nm optical signal;

5 a first photodiode capable of receiving a 1490 +/-5nm optical signal; and

a second photodiode capable of receiving a 1550 +/-5nm optical signal, wherein said first photodiode and said second photodiode are monolithically integrated on a substrate.

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26. The optical network terminal of Claim 25, wherein said emitting laser is monolithically integrated onto the substrate.

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27. The optical network terminal of Claim 25, wherein said emitting laser is placed on the first photodiode.

20 28. An optic device comprising:

an emitting laser; and

at least one photodiode that is monolithically integrated on a substrate.

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29. The optic device of Claim 28, wherein said emitting laser is monolithically integrated on top of said last photodiode that was monolithically integrated on the substrate.

30. The optic device of Claim 28, wherein said emitting laser is placed on top of said last photodiode that was monolithically integrated on the substrate.

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31. The optic device of Claim 28, further comprising a thin film filter located between each pair of photodiodes if any and between said emitting laser and said last photodiode that was monolithically integrated on the substrate.

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32. A method for making an optic device, said method comprising the steps of:

providing a substrate;

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monolithically forming at least one photodiode on said substrate;

placing/monolithically forming an emitting laser on top of said last formed photodiode.

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33. The method of Claim 32, further comprising a step of forming a thin film filter between each pair of photodiodes if any and between said emitting laser and said last photodiode that was monolithically integrated on the substrate.